

**CLAIMS**

1. A method of authenticating a GPRS communication unit on a GPRS communication system through an access point of a local network, the method comprising the steps of:
  - the GPRS communication unit attaching to the access point using a local network protocol, and
  - authenticating the GPRS communication unit by communicating GPRS authentication messages between the GPRS communication unit and a GPRS authentication element through the access point by encapsulation of GPRS authentication messages in local network authentication messages.
2. A method of authenticating a GPRS communication unit as claimed in claim 1 further comprising the step of authorising the access port for GPRS communication only if the GPRS communication unit is authenticated by the GPRS authentication element.
3. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of the access point requesting an identity from the GPRS communication unit.
4. A method of authenticating as claimed in claim 2 or 3 wherein the step of authenticating comprises the step of the GPRS communication unit transmitting an identity to the access point.
5. A method of authenticating as claimed in claim 3 or 4 wherein the identity includes a GPRS subscriber identity.
6. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of the access point

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communicating an access message to the GPRS authentication element indicating that the GPRS communication unit has attached to the access point.

7. A method of authenticating as claimed in any previous claim wherein  
5 the step of authenticating comprises the step of the communicating a GPRS Authentication Initiation message from the GPRS authentication element to the access point, and the step of communicating the GPRS Authentication Initiation message encapsulated in a local network authentication message from the access point to the GPRS communication unit.
10. 8. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step communicating a GPRS Attach Request message encapsulated in a local network authentication message from the GPRS communication unit to the access point, and the step of  
15 communicating the GPRS Attach Request message from the access point to the GPRS authentication element.
9. A method of authenticating as claimed in any previous claim wherein  
20 the step of authenticating comprises the step of the GPRS authentication element retrieving authentication data associated with the GPRS communication unit from a Home Location Register.
10. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of the communicating a GPRS  
25 Authentication and Ciphering Request message from the GPRS authentication element to the access point, and the step of communicating the GPRS Authentication and Ciphering Request message encapsulated in a local network authentication message from the access point to the GPRS communication unit.

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11. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of communicating a GPRS Authentication and Ciphering Response message encapsulated in a local network authentication message from the GPRS communication unit to the access point, and the step of communicating the GPRS Authentication and Ciphering Response message from the access point to the GPRS authentication element.
12. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of communicating a GPRS Attach Accept message from the GPRS authentication element to the access point, and the step of communicating the GPRS Attach Accept message encapsulated in a local network authentication message from the access point to the GPRS communication unit.
13. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of communicating a GPRS Attach Complete message encapsulated in a local network authentication message from the GPRS communication unit to the access point, and the step of communicating the GPRS Attach Complete message from the access point to the GPRS authentication element.
14. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of the GPRS authentication element communicating with a Home Location Register to perform a GPRS location update.
15. A method of authenticating as claimed in any previous claim wherein the step of authenticating comprises the step of communicating an authentication success message from the GPRS authentication element to the access point, and the step of authorising the access point for GPRS.

communication for the GPRS communication unit in response to receiving the authentication success message.

16. A method of authenticating as claimed in any previous claim wherein communication of GPRS authentication messages from the GPRS authentication element to the access point are by encapsulating GPRS authentication messages in local network authentication messages.
17. A method of authenticating as claimed in any previous claim wherein the authentication is part of a routing area update.
18. A method of authenticating as claimed in claim 1 wherein the step of authenticating comprises the steps of:
  - communicating a GPRS Authentication Initiation message from the GPRS authentication element to the access point, and the step of communicating the GPRS Authentication Initiation message encapsulated in a local network authentication message from the access point to the GPRS communication unit, followed by the step of:
    - communicating a GPRS Attach Request message encapsulated in a local network authentication message from the GPRS communication unit to the access point, and the step of communicating the GPRS Attach Request message from the access point to the GPRS authentication element, followed by the step of:
      - communicating a GPRS Authentication and Ciphering Request message from the GPRS authentication element to the access point, and the step of communicating the GPRS Authentication and Ciphering Request message encapsulated in a local network authentication message from the access point to the GPRS communication unit, followed by the step of:
        - communicating a GPRS Authentication and Ciphering Response message encapsulated in a local network authentication message from the GPRS communication unit to the access point, and the step of communicating

the GPRS Authentication and Ciphering Response message from the access point to the GPRS authentication element, followed by the step of:

- communicating a GPRS Attach Accept message from the GPRS authentication element to the access point, and the step of communicating the 5 GPRS Attach Accept message encapsulated in a local network authentication message from the access point to the GPRS communication unit, followed by the step of:
  - communicating a GPRS Attach Complete message encapsulated in a local network authentication message from the GPRS communication unit to 10 the access point, and the step of communicating the GPRS Attach Complete message from the access point to the GPRS authentication element, and followed by the step of:
    - communicating an authentication success message from the GPRS authentication element to the access point, and the step of authorising the 15 access port for GPRS communication in response to receiving the authentication success message.

19. A method of authenticating as claimed in any previous claim wherein the local network is a Wireless Local Area Network (WLAN).

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20. A method of authenticating as claimed claim 15 wherein the Wireless Local Area Network (WLAN) conforms to the Institute of Electrical and Electronic Engineers standard no. 802.1x.

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21. A method of authenticating as claimed in any previous claim wherein the local network authentication messages are extensible authentication messages.

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22. A method of authenticating as claimed in any previous claim wherein 30 the local network authentication messages are Extensible Authentication Protocol messages.

23. A method of authenticating as claimed in any previous claim wherein the GPRS authentication element is a Serving GPRS Support Node (SGSN).

5 24. A method of authenticating as claimed in any previous claim wherein the GPRS communication unit is a dual mode communication unit operable to communicate in accordance with a GPRS protocol and a local network protocol.

25. A communication system comprising a GPRS communication network and a local network, the communication system comprising:

10 means for a GPRS communication unit to attach to the access point using a local network protocol; and

means for authenticating the GPRS communication unit by communicating GPRS authentication messages between the GPRS

15 communication unit and a GPRS authentication element through the access point by encapsulation of GPRS authentication messages in local network authentication messages.